

Listing of Claims

1. (Currently Amended) An implantable cardiac massage apparatus for providing assistance to a heart having an apex and a base, the apparatus comprising:

a chamber array, the array comprising a series of spaced-apart, fluidically coupled chambers, the array having fluid input and output ports, and the chambers defining an inside surface which closely conforms to the external surface of a heart and;

pressure regulator means, the pressure regulator means being fluidly coupled to the array input port and output port, the pressure regulator means also being fluidically coupled to;

pump means, the pump means and the pressure regulator means being electronically coupled to;

controller means, the controller means being adapted to actuate the pump means and the pressure regulator means so that fluid is pumped, and flows, in only a single direction through the array, the direction being from the input ports to the output ports, the fluid is pumped substantially continuously by the pump means to the input port and the pressure regulator means intermittently inflates and deflates the chambers starting at the apex of the heart to create a rhythmic massage of the heart from its apex to its base thereby substantially imitating the natural contraction of the heart, the controller means being further adapted to receive sensor information input from;

a cardiac activity/sensor means, the cardiac activity/sensor means being adapted to sense cardiac activity and input sensor information to the controller means.

2. (Currently Amended) The apparatus of claim 1 which further includes an ~~implanted~~ implantable reservoir means fluidly coupled to the chamber array.

3. (Currently Amended) The apparatus of claim 1 which further includes an ~~implanted~~ implantable source of electrical energy electronically coupled to the pump means.

4. (Previously Presented) The apparatus of claim 1 electronically coupled to the controller means.

5. (Previously Presented) An apparatus of claim 1 wherein the pressure regulator means comprises a relief valve.

6. (Original) An apparatus of claim 1 wherein the pump means comprises a kinetic pump or axial turbine.

7. (Previously Presented) A method of mechanically assisting a heart comprising the steps of:

deploying an apparatus of claim 1 about the external surface of the heart;

activating the apparatus by energizing the controller means and in turn the pump means so as to cause fluid to flow through the apparatus;

pulsing fluid flow through the apparatus by operating the pressure regulator means the fluid flow starting at the apex of the heart and passing to the base of the heart thereby rhythmically massaging the heart from the apex toward its base to enhance the heart's fluid output in a manner similar to unassisted cardiac discharge.

8. (Currently Amended) An implantable cardiac massage apparatus for providing assistance to a heart having an apex and a base, the apparatus comprising:

a chamber array, An apparatus according to claim 1 wherein the chamber array comprises elastic Bourdon tubes, the array comprising a series of spaced-apart, fluidically coupled chambers the array having fluid input and output ports, and the chambers defining an inside surface which closely conforms to the external surface of a heart and;

pressure regulator means, the pressure regulator means being fluidly coupled to the array input port and output port, the pressure regulator means also being fluidically coupled to;

pump means, the pump means and the pressure regulator means being electronically coupled to;

controller means, the controller means being adapted to actuate the pump means and the pressure regulator means so that fluid is pumped by the pump means to the input port and the pressure regulator means intermittently inflates and deflates the chambers starting at the apex of the heart to create a rhythmic massage of the heart from its apex to its base thereby substantially imitating the natural contraction of the heart, the controller means being further adapted to receive sensor information input from;

a cardiac activity/sensor means, the cardiac activity/sensor means being adapted to sense cardiac activity and input sensor information to the controller means.

9. (New) An implantable cardiac massage apparatus for providing assistance to a heart having an apex and a base, the apparatus comprising:

a helically wound tubing formed into an array, the array defining an inside surface which closely conforms to the external surface of a heart and;

pressure regulator means, the pressure regulator means being fluidly coupled to the array input port and output port, the pressure regulator means also being fluidically coupled to;

pump means, the pump means and the pressure regulator means being electronically coupled to;

controller means, the controller means being adapted to actuate the pump means and the pressure regulator means so that fluid is pumped, and flows, in only a single direction through the array, the direction being from the input ports to the output ports, the fluid is pumped substantially continuously by the pump means to the input port and the pressure regulator means intermittently inflates and deflates the helically wound tubing starting at the apex of the heart to create a rhythmic massage of the heart from its apex to its base thereby substantially imitating the natural contraction of the heart, the controller means being further adapted to receive sensor information input from;

a cardiac activity/sensor means, the cardiac activity/sensor means being adapted to sense cardiac activity and input sensor information to the controller means.